

sected the mound of burning clay, and Mr. Cameron states that the interior of the mound thus disclosed resembled an old brick-kiln, from the baked appearance of the clays and shales. Falls from the cliffs continued all the afternoon, and the whole range of cliff is still in an unstable condition.

With regard to the cause of the landslide, it is somewhat remarkable that the fall should have occurred during a spell of dry weather, and not after heavy rain. This fact points to some other cause than rain or springs, and such a cause exists in the practice of digging out and taking away the cement-stones and layers of limestone which occur in the lower part of the cliffs. The abstraction of these must have weakened the cliff above, and have caused the cracks which have long been apparent in it; water issuing from the base of the Greensand would find its way into the cracks, and would still further loosen the cohesion of the masses. Finally, the dry weather caused contraction and widening of the cracks, with the result above described.

BRITISH COTTON CULTIVATION.¹

ABSTRACTS of a series of reports by Prof. W. Dunstan, F.R.S., Director of the Imperial Institute, on the quality of cotton grown in British possessions have been issued as a Parliamentary paper, which gives details with regard to the progress made in cotton cultivation in various parts of the Empire, other than India and Egypt, during the past two years. As instructive as the actual abstracts are brief statements prefixed to each, wherein the present position of cotton cultivation in the colony or protectorate referred to is reviewed.

It appears that the export of cotton from Cyprus, the only European possession dealt with, was much the same for 1905-6 and 1906-7, but that the figures for these years were more than double the figures for 1904-5.

As regards our East African possessions, the exports of cotton and cotton-seed from the Sudan during 1906 reached a total value of more than 45,000*l.*, as against some 23,000*l.* for 1905. From the East African Protectorate the exports during 1906-7 were valued at 1400*l.*, as against 1273*l.* for 1905-6 and 285*l.* for 1904-5. The increased export from Uganda was more marked, the figures for 1906-7 being more than 390,000 lb., valued at 11,400*l.*, as against 96,000 lb., valued at 1089*l.*, for 1905-6, and 21,566 lb., valued at 236*l.*, for 1905. From Nyasaland the exports for 1906-7 were 526,119 lb., valued at 15,345*l.*, a slight decrease on the figures for 1905-6, which were 776,621 lb., valued at 16,180*l.*, but a marked increase on those for 1904-5, when 285,185 lb., worth 5941*l.*, were exported.

As regards West Africa, we learn that exports of cotton from Gambia have ceased; the inhabitants will not take up cotton cultivation, the ground-nut industry being more profitable. The exports from Sierra Leone in 1906 were 87,800 lb., valued at 1829*l.*, as against 68,800 lb., worth 509*l.*, in 1905. A similar increase is recorded from the Gold Coast, whence the exports in 1906 were 92,886 lb., worth 1022*l.*, as against 29,200 lb., valued at 516*l.*, in 1905; also from Lagos, whence in 1906 the quantity exported was about 2,440,000 lb., worth 40,000*l.*, as against 1,281,000 lb., valued at 25,000*l.*, in 1905. On the other hand, the exports from southern Nigeria in 1905 only reached 85,000 lb., as against 285,000 lb. in the preceding year. In Lagos it is stated there

are large areas suitable for cotton-growing, but the transport difficulties are great.

The reports dealing with the South African colonies show that Rhodesia and the Transvaal are capable of yielding cottons of excellent quality, and that experimental cultivation in the Orange River Colony, in Cape Colony, and in Natal has given results sufficiently encouraging to warrant further trial. Difficulties with regard to labour and to transport will, however, have to be overcome before an industry can be established. The reports regarding Seychelles and Mauritius indicate that much the same conditions obtain there as prevail in South Africa.

The reports from Asia refer to the Straits Settlements, where the climate is said to be not altogether favourable to the industry, and British North Borneo, where the conditions are expected to be favourable, and there is an ample supply of labour though the exports are small.

As to the Australian colonies and New Guinea, we learn that there are extensive districts in which the soil and climate are suitable for cotton cultivation, but that considerable difficulty is experienced with regard to the supply of labour.

The reports from our American possessions show that in British Guiana the industry is insignificant, and, small as it is, shows a steady falling off. In British Honduras, though the conditions are otherwise favourable, there is a lack of efficient labour; and in Bermuda, owing to the high price of land and labour, it is unlikely that a profitable industry can be established. But the exports from the West Indies show that cotton-growing is there being rapidly extended under the guidance of the Imperial Department of Agriculture, directed by Sir Daniel Morris. The estimated value of the exports of cotton and cotton-seed for 1905 was more than 63,000*l.*; for 1906, more than 90,000*l.*; for the half-year ending June 30, 1907, more than 167,000*l.*

One of the general conclusions on which Prof. Dunstan insists is that in most cases, and especially in West Africa, the best chances of success lie in the improvement of native cottons rather than in the introduction of foreign cottons; another is that every encouragement and facility should be given to the improvement of native cultivation. It is pointed out that the extent to which cotton-growing will be resorted to by native cultivators must depend largely on the price which can be offered by cotton-buyers, and on the competition of other occupations and other agricultural crops.

NOTES.

THE council of the London Mathematical Society has awarded the De Morgan medal for 1908 to Dr. J. W. L. Glaisher, F.R.S., for his researches in pure mathematics.

THE Belgium Academy of Science, Literature, and the Fine Arts has elected Sir James Dewar an associate in the section of mathematical and physical science.

THE inaugural meeting of the Research Defence Society will be held at the house of the Royal Society of Medicine, 20 Hanover Square, W., to-morrow, June 19, at 5 o'clock. The Earl of Cromer, president of the society, will occupy the chair.

THE executive committee and science committee of the Franco-British Exhibition are issuing invitations for a reception to be held in the Science Court of the exhibition on Tuesday, June 30.

AN exhibition will be held at Faenza from August 15 to October 15 to commemorate the third centenary of the

¹ Colonial Reports—Miscellaneous. No. 50, British Cotton Cultivation. Reports on the Quality of Cottons grown in British Possessions. By Prof. Wyndham Dunstan, F.R.S., Director of the Imperial Institute. (Cd. 3997.) Price 2*d.*

birth of the Florentine physicist, Evangelista Torricelli. The exhibition will include international sections for meteorology and terrestrial physics, ceramics, and agricultural machinery. Prizes will be offered for competition in the two first-named sections. Inquiries should be addressed to Conte Cav. Carlo Cavina, president of the executive committee, at Faenza.

A MONUMENT to the memory of Boucher de Perthes was unveiled at Abbeville on June 8. Boucher de Perthes, who made important discoveries in prehistoric anthropology in the neighbourhood of Abbeville, died there in 1868. In 1832 he found at Thuisson, near Abbeville, the first stone engravings, and in 1863, in the Moulin Quignon cave, the remains of Quaternary man with flint axes. The collections made by Boucher de Perthes were bequeathed to the State, and are preserved in the Museum of Saint-Germain-en-Laye.

THE American Association for the Advancement of Science will devote a day during its meeting at Baltimore to the celebration of the centenary of the birth of Charles Darwin and the jubilee of the publication of the "Origin of Species." The programme includes, according to *Science*, arrangements for an introductory address by Prof. T. C. Chamberlin, of the University of Chicago, president of the association, and a number of discourses by American biologists and others. Among the latter we notice that Prof. E. B. Poulton, F.R.S., will speak on natural selection from the point of view of zoology.

A REUTER message from Auckland states that a remarkable volcanic outburst began in the island of Savaii, in the Samoan group, on May 10. The flow of lava was the greatest in the history of the island. It amounted to between 2000 and 3000 tons a minute, and streamed down in a great river from 6 inches to 6 feet deep, stretching in an almost continuous sheet over a width of eight miles. On reaching the coast it flowed over the cliffs into the sea, causing steam to rise in great quantities. The lava destroyed many native houses, and for a time threatened the town of Matatua.

At the General Conference on Weights and Measures, held at Paris in October last, a resolution was unanimously passed, urging the universal adoption of a metric carat of 200 milligrams as the standard of weight for diamonds and precious stones. This proposal, which received a large measure of support on the Continent, especially in France, Germany, Spain, and Belgium, was brought under the notice of the principal diamond dealers in this country by the Board of Trade early in the present year, but it has not met with a favourable reception from the trade, and unless the proposed new standard is generally adopted abroad it is unlikely that any further action in the matter will be taken by the Government. The French Ministry is now introducing a Bill to legalise the "metric carat" of 200 milligrams in that country, and to prohibit the use of the word carat to designate any other weight. A recent resolution of the Bombay Chamber of Commerce shows that the proposal for an international standard carat is receiving favourable consideration in India.

THE ninety-first annual meeting of the Société Helvétique des Sciences naturelles will be held from August 30 next to September 2 at Glaris. A provisional programme states that at general meetings on August 31 and September 2 the following addresses will be delivered:—Prof. K. Schröter, of Zurich, on an excursion to the Canary Islands; Prof. H. Schardt, of Montreux, on the great erratic boulders of Monthey and neighbourhood; Prof. A. Riggensbach-Burckhardt, of Bale, on gravity measurements

of the Swiss Geodetic Commission; Prof. Ch. E. Guye, of Geneva, on the electric arc as a powerful aid to science and industry; Dr. H. Greinacher, of Zurich, on radio-active substances; and Prof. R. Chodat, of Geneva, on Palæozoic ferns, their significance in modern plant palæontology. September 1 will be devoted to sectional meetings and to the annual meetings of the Swiss Geological, Botanical, Zoological, and Chemical Societies. A more detailed programme of the meetings will be available in July.

THE Sunday Society, which exists to obtain the opening of museums, art galleries, libraries, and gardens on Sundays, has been making attempts, though as yet unsuccessfully, to secure the opening on Sundays of the science and art collections at the Franco-British Exhibition. The experience gained during the last twelve years would appear to show that the Sunday opening of national museums and galleries has been greatly appreciated, and that there has been no abuse of the privilege. The last published returns show that in 1906 the number of Sunday visitors to the British Museum was 57,738, an average Sunday attendance of 1110; at the Natural History Museum for the same year the corresponding numbers were 61,151 and 1176. In 1905 the number of visitors to the Victoria and Albert Museum on Sundays was 93,005, an average Sunday attendance of 1755; the corresponding numbers in the same year for the Bethnal Green Museum were 74,990 and 1415.

ON Saturday last Mr. E. W. C. Kearney gave a demonstration of his high-speed railway system in the temporary building on the east side of Aldwych. Mr. Kearney runs his car upon a single rail, supporting it upon a two-wheel bogey at each end. Above the car there is a second rail engaging a second two-wheel bogey at each end. The upper and lower bogeys are carried upon the same shaft, and so turn together. The intention is to run out of the ground-level stations down an incline of 1 in 7 until a speed possibly of 200 miles per hour is attained, then along the level, and so up to the next station. If this could be done safely and successfully, then, without question, much time would be saved; but nothing which was said or demonstrated on Saturday with the help of a scale model about one-fifteenth the full size in any way made it evident that this would be the case, or that the great economy in first and in running cost claimed would be attained in practice. While the steep declivity would be convenient in the case of tube railways, it hardly meets the requirements of elevated or of long-distance railways, for which the motors would have to provide the whole acceleration. Might it not be well to revive the old brachistochrone problem which the brothers Bernoulli invented before its time and travel on cycloidal routes from place to place? Even Mr. Kearney would find it difficult to compete with this.

AFTER four months' canvassing among metal manufacturers and users, and two preliminary meetings held in Manchester, a new technical society called "The Institute of Metals" was formed at a meeting held at the Institution of Mechanical Engineers, Westminster, on Wednesday, June 10. Sir William White, K.C.B., F.R.S., who occupied the chair, has been for some years the chairman of the Alloys Research Committee, instituted by that body, which has concerned itself to some extent with the non-ferrous metals and their alloys. The following resolution was, after some discussion, adopted unanimously:—"That in view of the widely recognised need for a medium of communication for the advance of knowledge in connection with the production, manufacture, and use of the non-ferrous metals and their alloys, a society to be called 'The

Institute of Metals' shall be and is hereby constituted." Sir William White was unanimously elected the first president, and an interim council, composed of prominent metal manufacturers, ship-builders, marine and locomotive engineers, electric cable constructors, &c., and including representatives of pure science, was appointed to take the necessary steps to bring the institute into working order. The joint hon. secretaries are Prof. H. C. H. Carpenter, the University, Manchester, and Mr. W. H. Johnson, c/o Johnson, Clapham and Morris, Ltd., Manchester. Promises of support have been received from more than 200 persons.

THE late Dr. Oswald Seeliger, professor of zoology in the University of Rostock, whose death in his fifty-first year has just been announced, was well known for his many valuable contributions to knowledge, and particularly for his writings on the morphology of the Tunicata. The articles on this group in Bronn's "Klassen und Ordnungen" and in Brehm's "Thierleben" were from his pen. The researches with which his name is most familiarly associated are upon questions connected with the process of budding in Tunicata, Cœlenterata, and other animals. His statement that the nervous system of the ascidiozooids of *Pyrosoma* is derived from the mesoblast of the parent Cyathozoid, undermining, as it seemed to do, the theory of the germ layers, gave rise to a long and interesting controversy. More recently he repeated Boveri's famous experiment of fertilising the enucleated egg of one species of Echinoderm with the spermatozoon of another, and, like Delage and others, came to the conclusion that the hybrid thus produced does exhibit some of the maternal characters, and that, in consequence, the theory that the hereditary characters are alone borne by the nuclei of the germ cells is untenable. Seeliger's writings were clear and forcible, and as he was free from the ordinary prejudice of orthodox opinion in biological matters, his loss to science is severe.

THE second part of the Memoirs of the National Museum, Melbourne, is devoted to a monograph of the Silurian bivalve molluscs of Victoria, in the course of which the author, Mr. F. Chapman, palæontologist to the museum, describes and figures a number of new species.

WITH the June number *British Birds* commences its second volume, to which we wish every success. To that number Mr. W. H. Mullens commences a series of articles on the older British ornithologists, the first name on the list being that of William Turner, who was born just about 400 years ago, and was therefore a contemporary of the founder of Caius College, Cambridge. Previous to Turner's time, exact knowledge of British birds was practically *nil*, while ornithology was but little more cultivated on the Continent. Turner was the author of no fewer than thirty-nine works, among which the most famous is that dealing with the birds mentioned by Aristotle and Pliny. To this wonderful work may be attributed the rise of British ornithology.

WE have received a separate copy of a paper by Messrs. Huene and Lull, from the February number of the *American Journal of Science* (vol. xxv., p. 113), on the Triassic reptile *Hallopus victor*, which was regarded by its original describer, the late Prof. O. C. Marsh, as a theropod dinosaur. In some respects the pelvis is, however, more like that of an orthopod dinosaur, although in the form of the pubis, the calcaneum, the extreme thickness of the astragalus, the contour of the scapula, and the height of the ilium, the skeleton differs from all known members of that group. In the opinion of the authors (the grounds

of which are promised in a later memoir), the genus appears to be most nearly related to *Aëtosaurus* and its allies.

To the April number of *Spolia Zeylanica* Commander Boyle Somerville communicates a thoughtful paper on the submerged plateau surrounding Ceylon at an average distance of about a dozen miles from the coast, with depths shoaling from south to north from 40 to 20 fathoms. Everywhere there is a sudden drop to oceanic depths on the outer margin, but a slightly deeper channel or gully occurs in the centre, tapering off to the northward and ending in a marked shoaling, and the existence of banks, which begin at Mount Lavinia and extend northward. After referring to the occurrence of lakes or lagoons near the coast nearly all round the island, the author concludes that while the high-ground of Ceylon has existed as land for an extremely long period, the low-country has in the main been formed by the denudation of the central elevated area, and was laid down on a plateau of which the present fringe is a remnant. This accounts for the absence of coral reefs round most of the coast.

STONE implements from the Bulawayo district form the subject of an illustrated paper by the Rev. F. Gardner in vol. vii., part i., of the Proceedings of the Rhodesia Scientific Association. The account is based on the large collection in the Rhodesia Museum. Many of the implements are of well-defined shape and show workmanship of a high order, although not rising to the standard frequently noticeable in their corresponding (Neolithic) European prototypes. In the author's opinion, they represent a mixture, and are the product of many ages, some, perhaps, having been manufactured in quite recent times.

THE latest issue (vol. iii., No. 1) of the *Journal of Economic Biology* is devoted to an investigation, by Miss J. S. Bayliss, of the basidiomycetous fungus *Polystictus versicolor*, that grows as a saprophyte on dead wood, causing it to rot and crumble. The bracket-like fruiting body is characterised by a velvety zoned upper surface. In laboratory cultures spore sowings produced oidia and conidia, and on infected blocks of wood incipient fruiting bodies were produced, but full development was only obtained when the blocks were exposed under natural conditions. Similarly, it was observed that the sporophores will not develop in the dark or when revolving on a clinostat. The zoning is shown to be due to changes in the rate of growth dependent upon the temperature of the air and the amount of moisture present.

THE botanic station in St. Vincent occupies a portion of the site of the old botanic garden, established in 1765, that reached a high state of prosperity during the tenure of Dr. Anderson as superintendent. The station was re-established by Mr. H. Powell in 1890, who with the present curator, Mr. W. N. Sands, has contributed to its present standard of efficiency. A historical account, accompanied with reproductions of photographs taken in the gardens, appears in the annual report for 1906-7. Conditions in recent years have led to a remarkable increase in cotton cultivation, and a great reduction in the area devoted to sugar-cane. Arrowroot still supplies the most valuable asset of the colony, but the value of the cotton exported will shortly exceed that of the former product.

Two Bulletins received from the University of Illinois afford evidence of the value of the investigations carried on by the Engineering Experiment Station. Prof. A. N. Talbot (Bulletin No. 20) gives the results of tests of concrete and reinforced concrete columns, throwing light on

the properties of plain and hooped concrete. The additional strength of the hooped column over that for an unreinforced column of the same quality averages for each 1 per cent. of hooping 955 lb. per square inch for spiral hooped columns and 669 lb. per square inch for band-hooped columns having a diameter of 12 inches. Tests of a liquid-air plant are recorded by Mr. C. S. Hudson and Mr. C. M. Garland (Bulletin No. 21). The tests were made for the purpose of determining the most economical conditions for operating the liquid-air plant belonging to the University.

WE have received from the Rev. O. Fisher a letter commenting on the distinction drawn by Mr. R. D. Oldham between "earthquakes" and "earthshakes" in a communication published in the issue of NATURE for May 28. Mr. Oldham on that occasion wrote:—"We may say that earthquakes, or at any rate severe earthquakes, are frequently, if not invariably, caused by rupture of the earth's crust and the formation of fractures or faults in the solid rock, but these fractures, which are the primary cause of the earthquake, are only the secondary result of the earthshake, the action of which arises at a greater depth, and the ultimate cause of which lies beyond our present ken" (vol. lxxviii., p. 78). Mr. Fisher read this to imply that Mr. Oldham applied the term "earthshake" to the deep-seated cause of the "snap and jar" caused by a rupture of the rocks, which gives rise to the vibratory movement constituting an earthquake, and suggests, as more probable, that the deep-seated cause is of the nature of an accumulating stress, which goes on increasing until the crust gives way suddenly, producing the "snap and jar" which produces world-shaking results. "What we want," says Mr. Fisher, "is a term to express the molar displacement of the ground as distinguished from the vibratory." Mr. Oldham informs us that in reality he is in agreement with Mr. Fisher. "The word earthshake," he writes, "was not intended to apply to the slowly accumulating stresses, but to the molar displacements accompanying the abrupt relief of the strain induced by these stresses." Mr. Oldham says "it might have been better to have suggested a wholly new word, such as bathyseism, carrying with it no connotation of meaning, but so many 'seisms' have already been suggested, and so loosely used, that I was chary of inventing yet another."

WE have received from Prof. H. Mohn two valuable publications relating to the meteorological service of Norway for the year 1907:—(1) the year-book, containing complete observations or results at sixty stations, and (2) rainfall observations, containing daily measurements at 200 stations, with monthly or yearly amounts at a much larger number of places, for some of which the results are quoted so far back as 1867. These publications have been issued in the same excellent form for many years, and the data are of exceptional importance, due to the exposed position and topographical features of the country.

THE report of the observatory department of the National Physical Laboratory for the year 1907 shows that the only very large magnetic disturbance was that of February 9-10, already referred to in NATURE (February 14, 1907, vol. lxxv., p. 367); the mean declination for the year was $16^{\circ} 23' W$. The largest seismological disturbances recorded took place on April 15 (the Mexican earthquake), maximum amplitude, 15 mm., September 2, and December 30. The lowest temperature, $23^{\circ}.3$, occurred on January 27, and the highest, $77^{\circ}.7$, on September 25; the total rainfall was 23.85 inches. The verification of instruments (exclusive of watches and chronometers), one of the

most active branches of the useful work of the observatory, again shows a large increase, the total number of instruments tested being 34,700, or 5133 more than in the previous year, and was chiefly due to increased numbers of clinical and ordinary thermometers. A large part of the time devoted to experimental work has been occupied by observations on atmospheric electricity and on solar radiation.

IN *Engineering* of June 5 there is an illustrated article on electric iron and steel furnaces, in which the leading types are described. At the present time, electric iron smelting is still in its infancy, while electric melting and refining furnaces have been added to many notable works. There is a good deal of electric melting, but, so far, little smelting. The reasons are not far to seek. All furnaces are wasteful; the electric furnaces do not form an exception, and electricity is not inexpensive, whether generated by water-power or by coal. The advantages of water-power have been much over-rated. When water-power begins to develop, it becomes subject to rates and taxes. Hydro-electric installations are by no means simple. The water may fail in summer owing to drought and in winter owing to frost, and reserve steam-power has to be provided; if a good load-factor is to be maintained, the reserve must be of ample capacity. Manufacturers are, moreover, becoming sceptical as to the advantages to be gained by installing works close to the mines and to the waterfalls, so as to secure cheap power and to avoid the transport of ores. The power item is not, as a rule, the decisive factor, and the crude ore transport may, after all, prove economical.

THE practical value of the fascinating study of diatoms as a test of the powers of the microscope is illustrated by a note on *Biddulphia mobiliensis* contributed to the April Journal of the Royal Microscopical Society by Mr. Edward M. Nelson. The secondary structure of this diatom is so delicate that Mr. Nelson was unable to draw or even retain the image for any length of time, and in pointing out that the secondaries have only been seen with long-tube microscopes, the author states as his conclusion that "the ultimate appeal concerning any very minute structure must go to a long-tube microscope."

PROF. H. FEHR, editor of *L'Enseignement mathématique*, has reprinted from that journal the results of his inquiry on the work of mathematicians. It will be remembered that some time ago a circular was addressed to mathematicians containing thirty questions regarding their habits of life, the way in which they acquired an interest in mathematics, the advice they would give to a young mathematician, and other matters of a personal character. The classification of the answers has been undertaken by Profs. Th. Flournoy and Ed. Claparède, of the psychological department of the University of Geneva. Perhaps the diversity of the answers is one of the most noticeable features of the inquiry.

A NEW periodical entitled *Popular Electricity* has just been issued by the Electricity Publishing Co., of New York. The first number—for May—consists of thirty-six well illustrated pages dealing with such subjects of general interest as electric lighting in the house, how to read an electricity meter, the new metallic filament lamps, &c. The language is free from technicalities, and the treatment humorous on occasions. It would be interesting to know how far the electric milking machine and the electric shoeblack described are commercially successful in America.

THE March number of *Terrestrial Magnetism and Atmospheric Electricity* contains an article by Dr. L. A. Bauer on the question of the exact nature of the action of the earth on a magnet, which, according to our present ideas, should reduce to a couple. Most careful and accurate weighings of a magnet with its axis pointing in various directions have been made on a balance specially constructed to be free from magnetic material, and show that on the average for stations in Alaska, British Columbia, Kansas, Maryland, and Washington, the weight when the south pole of the magnet was to the north exceeds that when the magnet is reversed by 1 part in 1,000,000. In disturbed regions the differences of weight observed exceeded 1 part in 100,000. Preliminary experiments on the influence of magnetisation on the weight of a magnetisable material show an increase of the order of 1 part in 1,000,000 on magnetisation.

THE Transactions of the English Ceramic Society for the session 1906-7 show that a great deal of active experimental work is being done by members of the society, and that very considerable progress is being made, with the aid of scientific method, in elucidating obscure points in pottery work. A number of useful investigations are described in the Transactions, of which a few may be referred to as possessing more than a purely technical interest. Mr. Page contributes a paper on the properties of refractory clays, dealing principally with the connection between chemical composition and fusibility; Dr. J. W. Mellor and Mr. F. J. Austin have examined the changes in the microscopic character of various types of refractory substances when subjected to prolonged heating; and Dr. Mellor deals at length with the behaviour of pyritiferous clays on weathering and when heated. The members of the society are to be congratulated on the work they are doing in extending our knowledge of a very difficult subject.

AN eighth edition of "A Treatise on Qualitative Analysis and Practical Chemistry adapted for Use in the Laboratories of Colleges and Schools," by Dr. Frank Clowes, has been published by Messrs. J. and A. Churchill. The present edition has undergone revision mainly in the section on the preparation and detection of gases, and in sections dealing with the reactions and detection of organic substances.

IN Prof. D'Arcy Thompson's paper "On the Shapes of Eggs" in *NATURE* of June 4, the formula on p. 113 should be $\rho_n + \frac{T}{r} + \frac{T'}{r'} = P$, and in paragraph 13 the words "the egg is invariably spherical" should be "the yolk is invariably spherical." The first word on the penultimate line of this paragraph should also be *yolk* and not *egg*.

OUR ASTRONOMICAL COLUMN.

ENCKE'S COMET, 1908b.—According to the ephemeris given by M. Kamensky in No. 4241 of the *Astronomische Nachrichten*, the southerly declination of Encke's comet is increasing, and the comet is apparently travelling rapidly through the southern constellations Sculptor and Grus towards Indus. Its position on June 21 will be

$$R.A. = 24h. 0m., \text{ dec.} = -41^\circ 25'.$$

From an announcement in No. 4252 of the same journal (p. 71, June 3) we learn that the position determined by Mr. Woodgate, at the time of re-discovery on May 27, gave corrections of +5m. 22s. and -33' to the ephemeris.

A FOURTH MINOR PLANET NEAR JUPITER.—Elements calculated by Dr. Ebell for the orbit of the minor planet

NO. 2016, VOL. 78]

1908 C.S. indicate that this object belongs to the Achilles group of asteroids, which travel in orbits near to that of Jupiter. This makes the fourth member of this group to be discovered (the *Observatory*, June, p. 257, No. 397).

OBSERVATIONS OF JUPITER'S EIGHTH SATELLITE.—A note by Prof. E. C. Pickering, published in No. 4253 of the *Astronomische Nachrichten* (p. 87, June 5), states that, according to a telegram from Prof. Campbell, the eighth satellite of Jupiter was observed by Prof. Perrine, at the Lick Observatory, on April 1 and 29. The last observation at Greenwich was made on April 24, so that Prof. Perrine's second observation will serve to extend the path already observed, and will provide a useful check on the ephemeris calculated from the results of the Greenwich observations.

PHOTOGRAPHIC DETERMINATION OF STAR COLOURS.—In No. 3, vol. xxvii., of the *Astrophysical Journal* (April, p. 169) there is an interesting paper by Messrs. Parkhurst and Jordan, of the Yerkes Observatory, on the photographic determination of star colours and their relation to spectral types. The method employed is based on that suggested by Schwarzschild, in which it is assumed that a satisfactory measure of a star's colour may be obtained by comparing the visual magnitude of the star with the magnitude derived from photographs taken on ordinary plates, but the present workers have modified it by determining the "visual" magnitudes by photographic means. With this object in view, they regularly exposed pairs of ordinary ("Seed") and "Pan-iso" plates, the latter giving the "visual" magnitude. Their results show that this method furnishes a simultaneous comparison of the visual and photographic magnitudes of a star freed from most of the uncertainties of ordinary visual methods. As the colour intensities thus derived correspond, in general, to definite spectral types, this procedure furnishes a method of determining the spectra of stars which are too faint for the ordinary spectrographic method.

THE MAXIMUM OF MIRA IN OCTOBER, 1907.—During the period July 13, 1907, to March 9, 1908, Prof. A. A. Nijland made a series of observations of the magnitude of Mira, and in No. 4253 of the *Astronomische Nachrichten* (p. 79, June 5) he publishes the results obtained. These show that the maximum (mag. 3.25) was attained on October 30, 1907 = J.D. 2417879. The four last maxima observed are compared, as regards their dates, with the ephemeris published by Dr. Guthnick, and the differences (O-C) are thus shown to be +2, -19, -13, and -16 days respectively. The magnitudes at maximum range from 3.9 (J.D. 2417214) to 2.0 (J.D. 2417552), and the periods between the four most recently observed maxima, are shown to have been 310, 338, and 327 days respectively.

DETERMINATION OF LONGITUDE DIFFERENCE.—Bulletin No. 130 from the Lick Observatory describes the recent determination of the difference of longitude between the Lick and Mare Island Observatories, carried out by Messrs. Tucker and Sanford during April. The difference determined was 2m. 30.74s., with a probable error of $\pm 0.01s.$, and, accepting that of the Lick Observatory as 8h. 6m. 34.81s. W., this gives the longitude of the Mare Island Naval Observatory as 8h. 9m. 5.55s. W.

CORONAL STREAMERS.—In No. 4, vol. xxvii., of the *Astrophysical Journal* (p. 286, May), Prof. J. A. Miller describes a method whereby it becomes possible to determine the heliocentric position of a certain class of coronal streamers. The streamers discussed are those which first curve away from, and then towards, the projection of the pole of the sun, or *vice versa*. Applying his method to the discussion of such a streamer, shown on the photographs taken by Prof. Cogshall and himself in Spain in 1905, he finds the latitude and longitude of the point from which the streamer matter was projected, and also shows that the force of repulsion is so nearly equal to the attraction of the sun (the ratio being as 0.99:1.0) that the particle considered had probably been ejected some 251,860 seconds—or about seventy hours—before the eclipse occurred. At the time of the eclipse this particle was at the point of the streamer, where it reversed its direction of curvature, and was about 1.3 radii of the sun from its centre.